ORDER

7210.38A

CENTER WEATHER SERVICE UNIT (CWSU)

APRIL 6, 1984

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

Distribution: A-WX(AT)-3; A-Y(AY)-3; A-FAT-1((MAX)); A-FAT-2,3,4,5,6,7,8 (LTD)

Initiated By: AAT-330

RECORD OF CHANGES

DIRECTIVE NO. 7210.38A

CHANGE TO BASIC	SUPPLEMENTS			OPTIONAL USE	CHANGE TO BASIC	SUPPLEMENTS			OPTIONAL USE

FOREWORD

Our ability, over the years, to change our operational concepts quickly to match the everchanging needs of the aviation community is a mark of progress which has made everything else possible. There is now a need to modify our thinking concerning the nature and the emphasis of the services we provide in order to be properly responsive to user demand for weather intelligence.

We must improve the quality, quantity, and the operational pertinence of the weather data made available to ATC specialists. Improvements in the way we manage the traffic flow with this upgraded intelligence, and communicate this data between ATC specialists, and to the users, must also follow if we are to keep pace with annual air traffic growth rates.

Recent events have clearly demonstrated the impact weather can have on traffic flow management and individual flight operations. It is a factor that cannot be treated lightly regardless of the type of ATC facility, aircraft size, its operational characteristics, or the skill of the pilot. More aircraft are entering the system each year. The statistics make it clear that aviation weather will continue to demand center stage.

Past experience in aviation weather dissemination has confirmed that simply attempting to accelerate movement of data in quantity will not accomplish our objective. Accordingly, greater emphasis must be placed on screening the available information in order to disseminate it to those with a need to know. Selective dissemination is the key. It takes into account the need to alert facility management personnel and pilots of significant weather in sufficient detail to permit timely decisionmaking. It also provides the information the individual controller needs to effectively use his/her airspace.

This order prescribes national standard operating procedures for FAA personnel and National Weather Service (NWS) meteorologists assigned to ARTCCs as part of a Center Weather Service Unit (CWSU). Although it presents extensive instructions and directions, it is impossible to cover all situations that may develop. The duties and responsibilities defined herein are primary and may be supplemented by FAA and NWS directives as appropriate.

R. J. VAN VUREN
Associate Administrator for Air Traffic

TABLE OF CONTENTS

CHAPTER 1. GENERAL

1. PURPOSE. This order restates the requirement for the establishment of the Center Weather Service Unit (CWSU), and the national standard operating procedures for Federal Aviation Administration personnel and National Weather Service (NWS) meteorologists assigned to a CWSU.

2. DISTRIBUTION. This order is distributed to appropriate NWS offices, air traffic branches in Washington and Regional Headquarters, FAA Academy branches, and all air traffic field offices and facilities.

3. CANCELLATION. Order 7210.38, Center Weather Service Unit (CWSU), dated February 23, 1979, is canceled.

4. BACKGROUND. The Air Traffic Service established the CWSU as the focal point for professional meteorological services within the Air Route Traffic Control Centers (ARTCCs). NWS meteorologists are assigned to detect hazardous weather conditions and disseminate information on the hazard to the appropriate positions and facilities within the center's area of responsibility. The technical expertise of the CWSU meteorologist is complemented by the aviation and area knowledge of the CWSU Weather Coordinator (WC).

5-9 RESERVED

CHAPTER 2. DUTIES AND RESPONSIBILITIES

10. CENTER WEATHER SERVICE UNIT (CWSU)

a. The primary function and responsibility of the CWSU is to provide meteorological advice and consultation to center operations personnel and other designated FAA Air Traffic Facilities, terminal and FSS, within the ARTCC area of responsibility.

b Information provided by the CWSU is developed through analysis and interpretation of available weather data and is provided in the form of briefings and other weather products (forecasts and nowcasts) .

(1) Briefings - Generally consist of a forecast of weather conditions pertinent to the ARTCC area during a specified period, plus an extended outlook. Briefings will be scheduled and provided as required by the facility manager.

(2) Meteorological Impact Statement (MIS) - An unscheduled planning forecast describing conditions expected to begin within four to twelve hours which will, in the forecasters judgement, impact the flow of traffic within the ARTCC area.

(3) Center Weather Advisory (CWA) - An unscheduled air traffic and aircrew advisory statement which is generally a nowcast for conditions currently in existence or beginning within the next two hours, A CWA may be issued to supplement or redefine an existing SIGMET, or, when, as detailed in WSOM Chapter D-25, conditions warrant,

c. The duties and responsibilities described herein are not all inclusive, Facility managers shall ensure that comprehensive local orders and procedures for operation of the CWSU are developed to supplement this order. Local orders shall include a prioritized listing of the duties and responsibilities of both the meteorologist and WC. Exhibit D-25-3, Attachment 1, WSOM Chapter D-25, Center Weather Service Unit Priority of Duties, is the listing of meteorologist priorities. Changes will require approval by both NWS and FAA Regional Headquarters.

(1) Copies of local orders on CWSU procedures shall be forwarded to AAT-300.

d. Operational problems that cannot be resolved between the MIC and the facility manager will be forwarded to FAA and NWS regional headquarters.

11. FACILITY MANAGER,

a. The ARTCC facility manager has operational responsibility for the CWSU, and shall:

(1) Make provisions for the designation of a WC on each shift,

(2) Establish procedures to assure that operational personnel:

(a) Receive pertinent and timely weather data,

(b) Broadcast SIGMET/CWA messages as required.

(c) Solicit and relay PIREP's as requested.

(3) Provide facility and air traffic control system familiarization training for assigned meteorologists.

12. METEOROLOGIST-IN-CHARGE (MIC).

a. The MIC is the operational supervisor of the assigned meteorologists, and is responsible for ensuring that the CWSU meets the center's weather support requirements as established by this order and the facility manager,

b. The MIC shall establish time and attendance procedures for the CWSU meteorologists.

13. METEOROLOGIST.

a. Provides meteorological support for air traffic facilities, with the primary function of analyzing and interpreting available weather data to determine actual and near-term forecast weather conditions and to provide a "nowcasting" service. Nowcasting is a description of existing conditions or a diagnosis of a given situation which can be used to make operational decisions. Examples are a sooner-than-expected development of thunderstorms or the beginning of snow when none was anticipated. It allows the meteorologist to advise ATC personnel of changing weather conditions and provide an updated forecast.

b Monitor and seek, where necessary, sufficient weather intelligence to provide a continuous real-time depiction of weather conditions which affect or have the potential to affect air traffic services or aircraft operations within the assigned ARTCC area, to include, but not limited to:

(1) Thunderstorm location and intensity;

(2) Areas of precipitation;

(3) Cloud coverage;

(4) Icing levels;

(5) Turbulence;

(6) Winds aloft;

(7) Low level wind shear;

(8) Areas of less than 3 miles visibility and/or ceilings less than 3,000 feet, and

(9) Significant pressure changes (as defined in WSOM Chapter D-25).

c. Prepares and disseminates meteorological impact statements and center weather advisories as established by local order, either directly or through the WC, using the Leased Service A, 9020/FDEP, or long line telephone system, as appropriate.

d. Conducts weather familiarization training for air traffic personnel as required by the facility manager,

e. Conducts preshift weather briefings as required by the facility manager.

14. WEATHER COORDINATOR (WC).

a. This position functions as the interface between the NWS meteorologist and the facility air traffic staff, as required. The WC is primarily responsible for the inter/intrafacility dissemination of SIGMET's, CWA's, and urgent PIREP's, and provides assistance in the collection and dissemination of other significant weather information,

b. Manning of the WC positon is required on all shifts, and all personnel assigned to this function must have received prior training in the associated duties and responsibilities. If weather conditions and workload permit, the WC may perform other operational or administrative functions, however, the primary duty remains that of weather coordinator,

c. Priority of Duties and Responsibilities.

(1) Inter/intrafacility dissemination of SIGMET's.

(2) Disseminate CWA's within the ARTCC.

(3) Disseminate urgent PIREP's within the ARTCC.

(4) Disseminate CWA's to other facilities (via other than LSAS).

(5) Inter/intrafacility dissemination of Meteorological Impact Statements as required (via other than LSAS).

(6) Disseminate other weather intelligence within the ARTCC as specified by local requirements.

(7) Receipt and handling of requests for PIREP/SIGMET and other pertinent weather information,

d In the absence of a meteorologist, assistance may be obtained through an adjacent CWSU, or the Central Flow Weather Service Unit meteorologist.

15. CENTRAL FLOW WEATHER SERVICE UNIT (CFWSU).

a. Provides meteorological advice and consultation to Traffic Flow Management Branch (AAT-440) personnel on weather conditions which may adversely affect the National Airspace System (NAS).

b. CFWSU meteorologist responsibilities are outlined in WSOM Chapter D-25.

16-19 RESERVED

CHAPTER 3. ADMINISTRATION

20 OPERATING HOURS AND STAFFING. Total shift staffing and the operational hours of each CWSU shall be specified by the MIC in consonance with the ARTCC facility manager. Shift staffing shall be based upon available manpower, air traffic volume, and weather considerations. ARTCC facility managers shall ensure that the WC position is manned on all shifts.

21 LEAVE AND OVERTIME. Annual leave which affects the normal operating hours of the CWSU, and overtime, shall be subject to the approval of the ARTCC facility manager. Sick leave will be handled in accordance with standard procedures.

22. DOCUMENTATION AND REPORTING OF LSAS EQUIPMENT/CIRCUIT OUTAGES AND MALFUNCTIONS.

a. Documentation of LSAS equipment/circuit outages - Each CWSU shall record equipment/circuit outages on FAA Form 7230-4 (Daily Record of Facility Operation).

b. Program Reporting Procedures - Malfunctions or failures at the facility shall be analyzed to determine if the problem is either with WMSC or Western Union.

c. When it is determined the failure is Western Union's responsibility, the CWSU shall report the problem to the designated Western Union Customer Service Center (CSC). Western Union shall be requested to restore equipment/circuit failure as soon as possible.

(1) In addition to reporting trouble to Western Union, system outages shall also be reported to the ARTCC System Engineer for inclusion in the National Airspace Performance Reporting System.

(2) The following conditions shall be reported to the Regional Assistant LSAS Program Manager and Systems Management Center through the circuit coordinator when:

(a) Unable to contact the CSC within 15 minutes to report an outage.

(b) An unsatisfactory response to a trouble report has been received from Western Union.

(c) Western Union technician does not arrive within a reasonable commuting time or three hours, whichever occurs first.

(d) Unsatisfactory maintenance has been received on terminal equipment.

23-29 RESERVED

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE
Silver Spring, Md. 20910

February 10, 1984

W/OM13x:1

TO: All Holders of Operations Manual

SUBJECT: Transmittal Memorandum for Operations Manual Issuance 84-1

1. Material Transmitted:

WSOM Chapter D-25, Support to Air Traffic Facilities.

2. Summary:

The entire chapter has been revised. Major changes are as follows .

a. The chapter was restructured to more clearly state the air traffic facilities support to be provided by all designated elements of the National Weather Service . The sample Center Weather Service Unit (CWSU) Station Duty Manual has been deleted.

b. Definitions and terminology for all relevant FAA facilities and personnel have been updated.

c. The Central Flow Weather Service Unit (CFWSU) is described and its responsibilities defined.

d. The responsibilities, relationships, and priorities of the members of the CWSU, especially those of the recently added meteorologists in charge and the weather coordinator, have been defined, redefined, or clarified.

e. The products prepared by the CWSU to provide advice and consultation to the National Airspace System have been updated, redefined, and/or clarified .

f. The responsibility, methodology, and priority for the dissemination of these products have been defined.

g. The need for National Weather Service product coordination between facilities providing air traffic facility support has been defined.

h. The role, responsibility, and accountability of the National Weather Service area manager in CWSU and air traffic facility support have been clarified and emphasized .

i. The responsibility for providing pressure trend information to air traffic facilities has been transferred to the National Aviation Weather Advisory Unit which will communicate through the CFWSU.

3. Effect on Other Instructions:

This chapter is effective as of 1000 Greenwich Mean Time on March 15, 1984. It supersedes WSOM Chapter D-25, Issuance 78-13, dated August 8, 1978; Issuance 79-1, dated February 14, 1979; Operations Manual Letter 8-83, dated April 4, 1983; and any regional or local agreements with air traffic facilities which are at variance with the policies and instructions contained herein.

for Richard E. Hallgren
Assistant Administrator
for Weather Services

Issue Date	Org. Code
2-10-84	W/OM13x1

NATIONAL WEATHER SERVICE
Operations Manual

Part	Chap.
D	25

SUPPORT TO AIR TRAFFIC FACILITIES

Table of Contents

WSOM Issuance
84-1 2-10-84

SUPPORT TO AIR TRAFFIC FACILITIES (D-25)

Table of Contents

SECTION 1 SUPPORT TO AIR TRAFFIC FACILITIES (D-25)

1. Purpose. This chapter provides the National Weather Service's (NWS) policies on weather support of Federal Aviation Administration (FAA) Air Traffic Facilities. This support is designed to improve safety and enhance the efficient flow of air traffic. It is provided through specialized forecasts, nowcasts, and briefings.

1.1 Description of Air Traffic Facilities Supported.

a. Ventral Flow Control Facility (CFCF). CFCF is a part of the Air Traffic Control Command Center (ATCCC) located at the Federal Aviation Administration Headquarters. The ATCCC is an air traffic service facility consisting of CFCF and three other operational units: Central Altitude Reservation Function (CARF); Airport Reservation Office (ARO); and ATC Contingency Command Post. The CFCF is responsible for the coordination and approval of all major inter-center flow control restrictions made on a system basis in order to obtain maximum utilization of the airspace.

b. "Air Route Traffic Control Center (ARTCC). A radar facility established to provide air traffic control service to aircraft operating on IFR flight plans within controlled airspace and principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance services may be provided to VFR aircraft.

c. "Approach Control Facility. An Air Traffic Control (ATC) facility providing approach control service to one or more terminal areas.

d. "Airport Traffic Control Tower. A terminal facility providing ATC services to aircraft operating on the movement area and in the vicinity of an airport.

e. "Flight Service Station (FSS). An air traffic facility providing pilot weather briefing, en route communications, and VFR search and rescue services; assistance to lost aircraft and aircraft in emergency situations; relay of ATC clearances; preflight and in-flight advisory services, and other services to pilots, via air/ground communications facilities including the Enroute Flight Advisory Service (EFAS), a service specifically designed to provide timely weather information directly to the en route pilot."

2. General. The FAA requires the best possible weather information affecting thee and efficient utilization of airspace and airports to assist in air traffic management. This includes information on the following:

a. Convective weather.
be Low ceilings and visibility.
c. Cloud tops.
d. Wind, both surface and aloft.
e. Wind shear.

WSOM Issuance
84-1 2-10-84

f. Significant pressure changes.
g. Precipitation.
h. Turbulence.
i. Icing.

3. Central Flow Weather Service Unit (CFWSU). The CFWSU consists of NWS meteorologists assigned to CFCF for the purpose of providing consultation and advice for use by the staff of the ATCCC concerning weather conditions that may adversely affect the National Airspace System (NAS) during the next 24-hour period. This support is provided through detailed briefings of current and forecast weather several times a day.

3.1 CFWSU Meteorologist Responsibilities. The CFWSU meteorologists:

a. participate in Severe Weather Avoidance Nationwide (SWAN) plan activities as a primary source of weather information to the affected ATCCC unit;

b. coordinate with one or more Center Weather Service Units (CWSU's) concerning weather affecting the ARTCC areas; and

c. are consultants to ARTCC weather coordinators in the contiguous U.S. in the absence of a CWSU meteorologist. This backup service is intended during unavoidable breaks in scheduled coverage, i.e., sick leave or unit vacancies which leave the CWSU meteorologist in charge (MIC) unable to cover a regularly scheduled shift. (NOTE: When support is required, the MIC of a CWSU should arrange CRWSU backup sufficiently far in advance to allow the impact of the request to be evaluated. CFWSU is authorized, when necessary, to request that an adjacent CWSU assist in meeting this backup responsibility.)

4. Center Weather Service Unit (CWSU). The CWSU is a joint agency aviation weather support team composed of NWS meteorologists and an FAA controller or traffic management coordinator assigned to the weather coordinator position. The purpose of the CWSU is to provide weather consultation and advice to managers and staff within the ARTCC and to other supported FAA facilities. This is done through briefings and products (forecasts and nowcasts) describing actual or forecast adverse weather conditions which may affect air traffic flow or operational safety over the ARTCC's portion of the NAS or other locally defined special operations (e.g., offshore helicopter operations). The CWSU also provides weather information dissemination services making products available to outside users including pilots, dispatchers, and service companies. Exhibits D-25-1 and D-25-2 describe the area of responsibility and relationships, respectively, for each CWSU. Locally designated products for conditions outside of these areas may be prepared if, in the MIC's judgment, sufficient information and resources are available. CWSU meteorologist staffs operate two shifts per day with the actual duty hours determined by the MIC, in consonance with the ARTCC's manager, i.e., the air traffic manager (ATM).

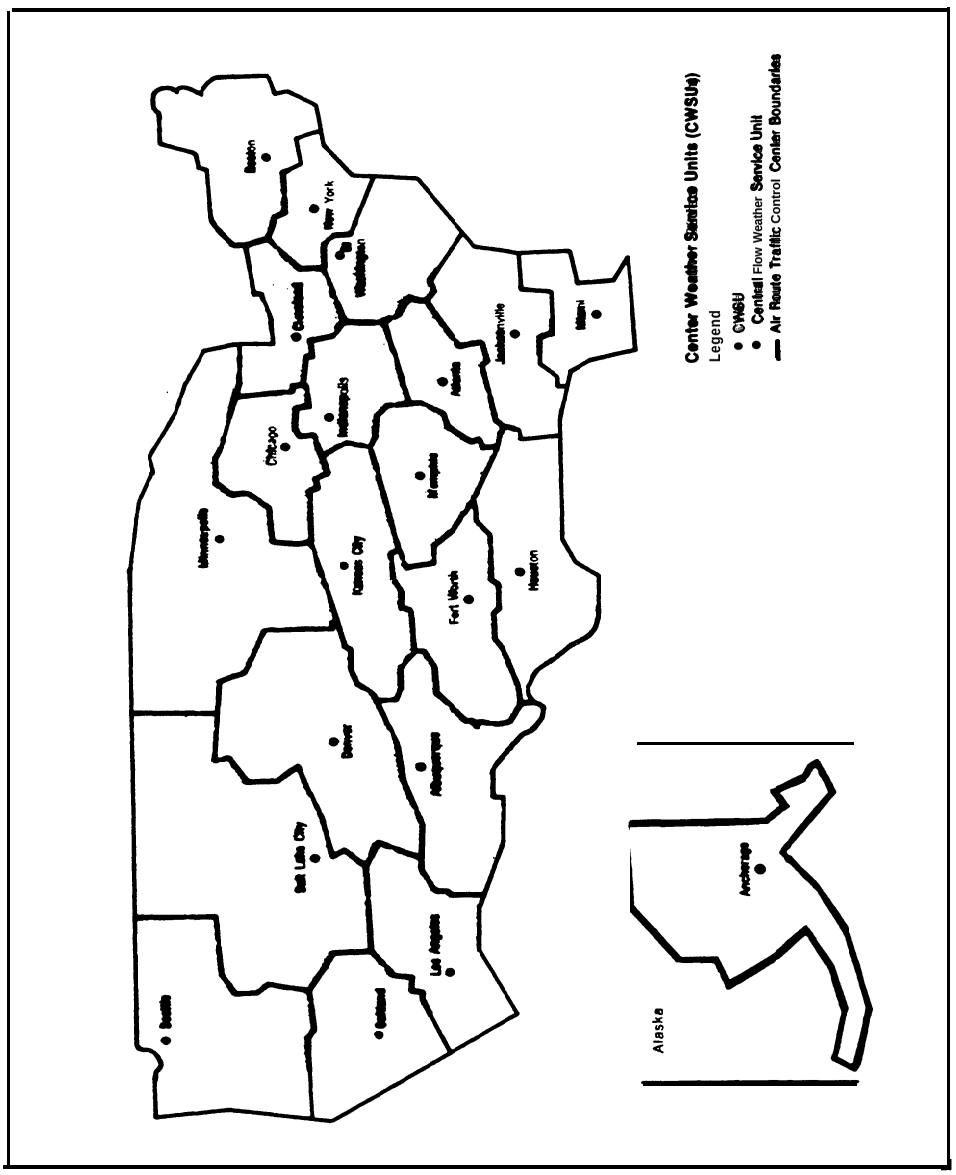

Exhibit D-25-1: Air Route Traffic Control Center/CWSU Areas

SUPPORT TO AIR TRAFFIC FACILITIES (D-25)

SECTION 4

ARTCC/ID LOCATION	NWS SUPPORT FACILITY	WSFO's IN CWSU AREA OF RESPONSIBILITY	CWSU SUPPORTING CWSU
ALBUQUERQUE/ZAB ALBUQUERQUE, NM	WSFO ABQ	ABQ, LBB, OKC, PHX. DEN	MKC
ANCHORAGE/ZAN ANCHORAGE, AK	WSFO ANC	ANC, FAI, JNU	ANC
ATLANTA/ZTL HAMPTON, GA	WSFO ATL	ATL, BHM, HEM, RDU, CRW, DCA	WBC
BOSTON/ZBW NASHUA, NH	WSFO BOS	BOS, ALB, PWM,	WBC
CHICAGO/ZAU AURORA, IL	WSFO CHI	CHI, IND, ARB, MKE, DSM	MKC
CLEVELAND/ZOB OBERLIN, OH	WSFO CLE	CLE, PIT, BUF, CRW, DTW	WBC
DENVER/ZDU LONGMONT, CO	WSFO DEN	ABQ, CYS, DEN, FSD, OMA, PHX, SLC, TOP, GTF	MKC
FORT WORTH/ZFW EULESS, TX	WSFO DFW	DFW, OKC, MSY, LIT, ABQ, LBB	MSY
HOUSTON/ZHU HOUSTON, TX	WSFO SAT	DFW, MSY, SAT, JAN, LBB, BHM	MSY
INDIANAPOLIS/ZID INDIANAPOLIS, IN	WSFO IND	IND, SDF, CLE, CRW, MEM, CHI	MKC
JACKSONVILLE/ZJX HILLIARD, FL	WSFO MIA	CAE, ATL, MIA, BHM	MIA
KANSAS CITY/ZKC OLATHE, KS	WSFO TOP	TOP, STL, CHI, OMA, DEN, OKC, DSM, LBC	MKC
LOS ANGELES/ZLA PALMDALE, CA	WSFO LAX	LAX, PHX, RNO, SFO, SLC	SFO
MEMPHIS/ZME MEMPHIS; TN	WSFO MEM	MEM, LIT, JAN, BHM, MSY, CHI, SDF, STL	MSY
MIAMI/ZMA MIAMI, FL	WSFO MIA	MIA	MIA
MINNEAPOLIS/ZMP FARMINGTON, MN	WSFO MSP	ARB, BIS, DSM, FSD, MKE MSP, OMA, STL, TOP	MKC
NEW YORK/ZNY RONKONKOMA, NY	WSFO NYC	NYC, PHL, ALB, BOS	WBC
OAKLAND/ZOA FREMONT, CA	WSFO SFO	LAX, RNO, SFO	SFO
SALT LAKE CITY/ZLC SALT LAKE CITY, UT	WSFO SLC	BIS, BOI, CYS, DEN, FSD GTF, PDX, RNO, SLC	SFO
SEATTLE/ZSE AUBURN, WA	WSFO SEA	BOI, GTF, PDX, RNO, SEA, SFO	SFO
WASHINGTON/ZDC LEESBURG, VA	WSFO WBC	DCA, PHL, CRW, RDU	WBC

Exhibit D-25-2: Relationships of Center Weather Service Units

6

WSOM Issuance
84-1 2-10-84

SECTION 4 SUPPORT TO AIR TRAFFIC FACILITIES (D-25)

4.1 Responsibilities.

4.1.1 **The ARTCC Manager.** The ATM of each ARTCC has operational responsibility for the CWSU. ATM's oversee implementation of FAA and NWS CWSU operating policies and bring any special local requirements to the attention of the CWSU MIC.

4.1.2 The CWSU Meteorologist in Charge. The CWSU MIC is the first line supervisor of the assigned meteorologists. The MIC determines the procedures to be followed in implementing this chapter, FM order 7210.38A and compatible or approved procedures to meet special local requirements. Such procedures will be detailed in the CWSU Station Duty Manual (SDM).

4.1.3 The CWSU Meteorologist. The CWSU meteorologists are forecasters who monitor, review, analyze, and Interpret weather Information pertinent to the airways and air traffic terminals in the ARTCC area of responsibility. They prepare briefings, nowcasts, and forecasts to inform FAA area supervisors, traffic management coordinators, sector controllers, other supported FAA facilities, and the CFWSU meteorologists of any weather conditions or changes that may affect the safe flow of air traffic. This is done either directly or through the weather coordinator.

The CWSU meteorologists have the following responsibilities:

a. Provide detailed briefings of current and forecast weather conditions affecting the NAS for ARTCC and designated EFAS and/or control tower personnel at least once per shift. Additional briefings may be scheduled routinely or provided as conditions require.

b. Solicit Pilot Reports (PIREP), through the weather coordinator directly from the controllers, from known or suspected areas where conditions meet or approach advisory criteria. Solicited or unsolicited PIREP's meeting urgent PIREP criteria will be immediately relayed by the CWSU into the FAA's Leased Service A System (LSAS) for nationwide distribution. Other PIREP's will be relayed by the weather coordinator or, as higher priority duties permit, by the meteorologist.

c. Ensure that reports of conditions meeting Urgent PIREP criteria (including wind shear) reach the appropriate Weather Service Forecast Office(s) (WSFO), the National Aviation Weather Advisory Unit (NAWAU), and/or the CFWSU meteorologist via the LSAS or by-telephone.

d. Relay Pilot Reports of conditions meeting Severe Weather Warning criteria to the NWS office with local warning responsibility via telephone.

e. Relay reports of winds meeting Winds Aloft Forecast amendment criteria to the appropriate WSFO for action.

f. Conduct weather training sessions for the ARTCC controllers, as workload permits.

g. Coordinate with the CWSU or act as consultants to CFCF in situations where weather conditions impede the normal flow of traffic in their ARTCC area.

h. Issue forecasts and nowcasts [Meteorological Impact Statements (HIS) and Center Weather Advisories (CWA)] when conditions warrant

i. Disseminate CWSU products and other specified pertinent weather intelligence (products and information) within the ARTCC to appropriate FAA facilities within the ARTCC area of responsibility and to other users when the weather coordinator position is not staffed.

j. Provide special, on-request Pilot Weather Briefings (PUB) to U.S. Government units (e.g., Air Force One), and courtesy PWB's to FAA pilot employees in or in contact with the ARTCC. These briefings will be provided only by CWSU meteorologists holding valid PUB certificates and as workload permits. Briefings will be conducted and documented in accordance with WSOM Chapter D-26. Weather consultation and advice (as opposed to a direct forecaster to pilot PWB) may also be provided to airborne pilots in contact with the ARTCC, either through appropriate ARTCC personnel or directly, during weather-related emergencies. Procedures for any direct forecaster to pilot communications must be clearly stated in the CWSU SOM. Any other PWB duties are not the function of the CWSU and will be referred to a Flight Service Station or National Weather Service Office.

4.1.4 The Weather Coordinator. While the CWSU meteorologists interact directly with NWS components, the weather coordinator is the designated interface between the CWSU meteorologist and the ARTCC controllers, FAA facilities within the ARTCC area of responsibility, and users to whom CWSU products are disseminated. The task of gathering and forwarding weather information into and out of the CWSU, as reflected by the duties listed in exhibit D-25-3, rests with the weather coordinator when that position is staffed. This will ensure that PIREP's are collected to enhance the CWSU information data base and are disseminated through the FAA LSAS; and that ARTCC tailored weather information is relayed to intra-facility positions and appropriate external FAA facilities and other users.

4.2 Priority of Duties. The CWSU weather coordinator and the CWSU meteorologist will operate as a team with each providing special skills for the enhancement of ARTCC operations. This team concept should result in a cooperative effort to fulfill the responsibilities and duties previously outlined. In the event that weather conditions and/or staffing deficiencies make it impossible to accomplish all of the assigned duties, the CWSU staff will use the list of duty priorities (exhibit D-25-3) to determine which tasks will be done first. It is recommended that a copy of this list be posted in the CWSU work area as a ready reference for the staff and for the information of ARTCC personnel. It should be emphasized that this list is not a schedule of tasks nor must the listed order of duties necessarily be reflected in task schedules as determined at the local level. The weather coordinator position, when staffed, will have primary responsibility for the duties indicated in

Center Weather Service Unit Priority of Duties

1. Prepare Center Weather Advisory (CWA) (LSAS dissemination)

& 2. Disseminate CWA within ARTCC

3. Provide weather consultation to airborne pilot in contact with ARTCC involved in a weather-related emergency

4. Coordinate with NWS office(s) issuing product(s) affected by CWA

5. Disseminate Pilot Report (PIREP) meeting urgent criteria (via LSAS)

6. Disseminate Urgent PIREP to appropriate NWS office(s)/unit(s) (if not accomplished by 5).

& 7. Disseminate Urgent PIREP within ARTCC

8. Prepare scheduled briefing

9. Deliver scheduled briefing for assembled ARTCC personnel

& 10. Disseminate CWA beyond the ARTCC (via other than LSAS)

11. Coordinate with NWS office(s) issuing product(s) affected by Meteorological Impact Statement (MIS)

12. Prepare MIS (LSAS dissemination)

13. Deliver scheduled briefing to dispersed ARTCC personnel and/or designated EFAS and control tower personnel

14. Provide special PWB to requesting U.S. Government unit (e.g., AF One)

15. Solicit/gather PIREP's or other weather intelligence

16. Prepare locally specified displays of time-critical conditions within or affecting the ARTCC area of responsibility

& 17. Disseminate Meteorological Impact Statement (via other than LSAS)

18. Disseminate nonurgent PIREP's

& 19. Disseminate other weather intelligence within the ARTCC as specified by local requirements

20. Provide courtesy Pilot Weather Briefing to FAA pilot employee

Exhibit D-25-3: Center Weather Service Unit Priority of Duties

exhibit D-25-3 by the ampersand (&). These items will be of top priority with assistance from the meteorologist if other meteorologist's duties permit.

4.3 **Briefings and Products.** The CWSU will issue and disseminate briefings and products as detailed in this chapter and additionally as specified in the Station Duty Manual. The conditions described in these products will be restricted to those within the horizontal boundaries of the ARTCC's area of responsibility and will include all altitudes within these boundaries. Points used to describe the areal location and extent of these conditions should be the minimum number necessary to describe the area accurately. If appropriate, nearby points outside of the ARTCC area may be used to simplify the area shape or reduce the number of points required to describe where the conditions are occurring or expected. When the conditions described extend beyond the ARTCC's area, that fact should be included in the text especially for products available to pilots in flight.

All abbreviations and contractions used in CWSU products will be consistent with FAA Contractions Handbook 7340.1. Terms used will be consistent with WSOM Chapters D-20 and D-22. All times will be expressed numerically, e.g., "BY 012" will be used instead of "BY SUNSET" or "BY EVENING."

The issuance time of regularly scheduled briefings and products will be developed locally in consonance with the ATM or designee. The criteria, content, and sample alphanumeric formats of the national standard briefings and products are shown below. Graphic representations of these may be prepared and displayed within the ARTCC in addition to the alphanumeric version. If no operational use exists for the alphanumeric version of the briefings' content, then they need not be prepared.

Retention instructions contained in this chapter and in WSOM Chapter D-90 refer only to the alphanumeric versions of CWSU briefings and products. Redundant graphic versions need not be retained unless no operational use is made of an alphanumeric version of a product or briefing. Worksheets used to update briefings or to supplement other products also need not be retained.

All users of CWSU products should be kept aware of the fact that these products are not available 24 hours a day. This may be accomplished by adding the remark "LAST" to the end of those products which will be in effect when the unit's duty hours end.

4.3.1 Briefings. A CWSU briefing will consist of a discussion of current and forecast weather conditions relevant to the ARTCC area during the shift in which it is issued (generally 6 to 8 hours) and an outlook extending into the following shift or through the overnight off-duty hours period. Each briefing will contain as a minimum the information shown in the sample alphanumeric briefing format below. If no operational use exists for an alphanumeric version of the briefing content, any graphic version will contain the same information, appropriately labeled, and should be on the fewest possible number of separate sheets. The graphic version of the briefing, in this case will be retained (see section 4.8.1).

SECTION 4 SUPPORT TO AIR TRAFFIC FACILITIES (D-25)

Format

ARTCC Designator "CWSU BRIEFING" Date and time (GMT) issued - Date and time ending

a. MET Impact Statement - conditions meeting any nonconvective MIS criterion or thunderstorms (when issued at the sane time as the briefing)

b. Synopsis - discussion of weather systems and their movements

c. General Weather and Outlook - flight conditions (weather, turbulence, icing, etc.), clouds, and visibility

d. Terminal Weather - for locally designated large hub airports, including surface winds even if below 10 knots. NOTE: The FAA has defined large hub as an area, city, or standard metropolitan statistical area where at least 1 percent of all scheduled air carrier passengers in the U.S. are enplaned.

e. Location(s) and speed(s) of jetstream(s)

f. Freezing Level

Example

ZHU CWSU BRIEFING 252145-261000

MET IMPACT STATEMENT...SCT EMBEDDED TSTMS ACROSS ZHU AREA FM SRN TX TO FL WIXL

CONTINUE NEXT FEW HOURS WITH ISOLATED EMBEDDED TSTMS TOPS AROUND 500 WITHIN 50 MILE RADIUS OF MSY. TSTMS WILL DECREASE RAPIDLY AFTER 00Z.

SYNOPSIS...STNRY FNT EXTDS FM TX PNHDL NR AMA TO LOU PRES SYS OVR SRN AR THEN EWD ACRS KY AND NC INTO ATLC OCEAN. HI PRES SYS CNTRD OVR NY.

GENERAL WEATHER...CLDS 20-50 SCT OCNLY BKN WITH SCT TSTMS SRN TX TO FL GENLY 30 TO 130 MILES INLAND MOVG NWWD AT 10-15KTS. TOPS IN STRONGEST TSTMS LOCATED OVR SRN LA AND MS ARE ABV 500.

OTLK 0521-10Z...VFR XCPT PTCHY GF AFT 08Z.

TERMINALS...HOU/IAH AND NEW/MSY 20-40 SCT OCNLY BKN 120 BKN 250 BKN-OVC 2206 CHC 20 OVC 2TRW+ 035. AFT 022 120 SCT XCPT PTCHY 2-5GF AFT 08Z.

JETSTREAM...50-70 KT JET EXTENDS FM CNTRL OH NEWD TO ME.

FREEZING LVL...7-10-150.

4.3.2 Meteorological Impact Statement. An MIS is an unscheduled flow control and air traffic/flight operations planning forecast. It describes conditions expected to begin generally 4 to 12 hours after issuance or conditions existing at the time the briefing is issued or when CWSU operations begin if they will persist for at least 3 hours. It is an air traffic oriented forecast product intended for those personnel at ARTCC, CFWSU/CERAP, and large hub terminal air traffic facilities responsible for making flow control and flow control related decisions. It will enable them to include the impact of expected locally and/or nationally specified weather conditions in those decisions. As a minimum, an MIS will be issued when:

a. any of the following conditions occur or are forecast to occur

1. Conditions meeting Convective SIGMET criteria (see WSOM Chapter D-22)
2. Icing - moderate or greater
3. Turbulence - moderate or greater
4. Heavy precipitation
5. Freezing precipitation
6. Conditions at or approaching low IFR (WSOM Chapter D-21)
7. Surface winds (including gusts) 30 knots or greater
8. Lou level wind shear (within 2,000 feet of the surface)
9. Volcanic ash, dust storms, or sandstorm; and

b. the conditions listed above will, in the forecasters judgment, impact the flow of air traffic within the ARTCC area of responsibility; and

c. the forecast lead time (the time between issuance and onset of a phenomenon), in the forecasters judgment, is sufficient to make issuance of a CWA unnecessary or premature.

The statement will describe the location of the phenomenon, using ARTCC relevant points of reference (e.g., VORTAC) and including the height, extent, intensity, and movement. MIS issuances will be numbered sequentially beginning at midnight local time each day. Forecasters should be aware that the MIS is disseminated and stored as a replaceable product. This means that each issuance must contain the details of all pertinent, known conditions meeting MIS issuance criteria including continuing conditions described in previously issued MISs.

The statement will be distributed to ARTCC area supervisors and traffic management coordinators and entered through FAA LSAS and other communications media so that it will be available for dissemination to FAA and NWS facilities including adjacent CWSUs, the CFWSU, and locally designated hub terminal facilities. Distribution may be directly by the CWSU meteorologist or through the weather coordinator. When an MIS is issued concurrently with a briefing, it will be distributed to those media and facilities mentioned above which do not receive, an alphanumeric version of the briefing's contents.

Format

ARTCC Designator WHIS" issuance number Date and time (GMT) issued - Valid-until date and time (GMT)

TEXT

Example

ZJX MIS 02 111245-122100

SCT LVL 3 AND 4 TSTMS ALG N-S RTES S OF ILM AND E OF SAV-OMN LN DVLPG BY 16Z. MAX TOPS 350-400. ELSW ZJX AREA LVL 3 AND 4 TSTMS FRMG IN SHRT LNS OR CLUSTERS AFT 17Z WITH FEW RCHG LVL 5-6. CELLS MOVG GENLY SEWD 10 KTS CONT THRU 00Z. CONDS LWRG OCNLY TO LIFR IN HVY PCPN AFT 17Z.

The format of the MIS communications header above and in the CWA format below must be followed exactly if the products are to be disseminated through the LSASs.

4.3.3 Center Weather Advisory (CWA). The CWA is an unscheduled in-flight flow-control, air traffic, and air crew advisory. It is for the guidance of the ARTCC personnel, air crews in flight, designated FAA facilities, and CFWSU meteorologists for use in anticipating and avoiding adverse weather conditions in the en route and terminal environments. By nature of its short lead time, the CWA is not a flight planning product. It is generally a Nowcast for conditions beginning within the next 2 hours and also should reflect the weather conditions in existence at the time of issuance. If conditions are expected to persist beyond the valid period of the advisory, a statement to that effect should be included in the last line of the advisory text and additional CWAs issued. If conditions extend beyond the ARTCC area, a statement to that effect should be included in the text.

Each WA will have a phenomenon number (1-6) immediately following the ARTCC identifier. A number will be assigned to each meteorologically distinct condition (e.g., jetstream Clear Air Turbulence) or group of conditions (e.g., low IFR and icing northwest of a low center) meeting CWA issuance criteria. This will make it possible to store and disseminate CWA's for up to six unrelated conditions with each capable of being individually updated. The CWA will contain an issuance time and a valid-until time in the heading line. The difference between the two will not exceed 2 hours.

CWA issuances for each phenomenon will be sequentially numbered starting at midnight local time each day. The headers of CWA's that are based on existing nonconvective SIGMET's or AIRMET's will include the associated alphanumeric designator (e.g., JULIETT 4) following the issuance number of the CWA and a solidus (/). Each CWA will be disseminated, either directly by the CWSU meteorologist or through the weather coordinator, to the affected ARTCC sectors and terminal facilities for broadcast and to the LSASs. A hard copy of each WA will be time stamped after dissemination.

SUPPORT TO AIR TRAFFIC FACILITIES (D-25) SECTION 4

There are three situations in which a CWA could be issued:

a. The CWSU meteorologist will issue a CWA:

1. As a supplement to an existing SIGMET (including Convective SIGMET), AIRMET, or Area Forecast (FA) section. The issuance of a CWA in this circumstance should be limited to those occasions, when, in the judgment of the CWSU meteorologist, a redefining statement, update, or advanced amendment is adequately supported by real-time information. Such information regarding the phenomenon covered by the NAWAU product may be in the form of pilot reports, radar, satellite, or information from other sources. The purpose of the CWA, in this case, is to improve or update the definition of the phenomenon in terms of relevance to users within the ARTCC area, location, movement, extent, and/or intensity. For an IFR AIRMET, for example, a CWA describing the area(s) of low IFR (LIFR) conditions in terms of ARTCC reference points would be a valid redefinition of the location and "intensity" relevant to the ARTCC's area and meeting documented requirements.

2. When an In-flight Advisory has not yet been issued but observed or expected weather conditions meet SIGMET/AIRMET criteria based on current pilot reports and reinforced by other sources of information about existing meteorological conditions. In this situation, the CWSU meteorologist should call the appropriate forecaster at the NAWAU or appropriate Alaska WSFO. If the CWSU forecaster determines that it is necessary to issue a CWA to allow lead-time while the SIGMET/AIRMET is being prepared, the CWA will be issued and should indicate that a SIGMET/AIRMET will be issued shortly.

b. The CWSU meteorologist may issue a CWA:

When observed or developing weather conditions do not meet SIGMET (including Convective SIGMET) or AIRMET criteria, e.g., in terms of intensity or areal coverage, but current pilot reports or other weather information sources indicate that an existing or anticipated meteorological phenomena will adversely affect the safe flow of air traffic within the ARTCC area of responsibility. In this situation the data available must be sufficient, in the judgment of the CWSU meteorologist, to support both the issuance of such an advisory and, if necessary, its continuation.

Format

ARTCC Designator and Phenomenon number (numbers 1-6 for replaceability) "CWA," issuance number (two digit)//In-flight Advisory alphanumeric designator (if applicable) Date and Time (GMT) issued - Valid-until date and time

TEXT

Examples

ZOB3 CWA 01 032141-032300

LN LVL 5 AND 6 TSTMS 10S DET TO 40N DJB TO 40 E SBN TO 80SE MKG MOVG FROM 2525. 3/4 INCH HAIL RPRTD LAST 5 MINS 20 SW YIP. LVL 4-6 TSTMS CONTG DTW AREA BYD 2300.

ZKC1 CWA 01/ALFA 4 121528-121728

NMRS RPTS OF MDT TO SVR ICG 080-090 30 MILE RADIUS OF STL. LGT OR NEG ICG RPTD 040-120 RMNDR OF ZKC AREA AND NE OF AREA.

4.4 Forecast Coordination. Frequently the forecast products issued by the NAWAU, national centers, or WSFO's and the CWSU, will address the same event within the same area and time period. Maximum coordination between the responsible offices prior to CWA issuance is essential in these cases to avoid confusion and avert any possible negative impact on aviation safety. To ensure adequate forecast coordination, the CWSU forecasters will communicate with WSFO's and national centers to discuss those CWSU products (i.e., CWA's or MIS's) to be issued as preliminary advisories or advanced amendments to scheduled Area or Terminal Forecasts, In-flight advisories, watches, warnings, or bulletins. This is particularly important when those products concern unexpected or suddenly changing weather conditions. A CWA may be issued before coordination:

a. when time is of the essence and meteorological phenomena have an immediate effect on the safe flow of air traffic within the ARTCC area of responsibility or

b. in other situations where meteorological phenomena affect the flow of air traffic but are not currently meeting or approaching In-flight Advisory criteria.

The NAWAU and the Alaska WSFO's have the final responsibility for issuing Area Forecasts and In-flight Advisories and thus their concurrence in the issuance of CWA's amending or preceding one of their products is highly desirable. The concurrence of WSFO's with Terminal Forecast (FT) responsibility for large hub area airports is likewise desirable before the issuance of a CWSU product which implies an amendment to that FT. In situations where a CWA has been issued prior to coordination, notification of the NAWAU or appropriate NWS national center or WSFO must follow as soon as higher priority duties permit.

A CWA issuance for conditions not meeting In-flight Advisory criteria, while generally based on those criteria, is primarily due to the forecaster's recognition that a condition is having a negative impact on the safe flow of air traffic. Prior coordination with the NAWAU in this situation should take place if the WA indicates a trend towards an In-flight Advisory criterion. Other NWS offices and/or units whose product(s) may be impacted by the CWA

also should receive prior notification of the issuance, If time permits. In either case the CWSU forecaster has the final responsibility for issuing a CWA.

All users and forecasters should understand that every In-flight advisory does not require a WA. Also, every product for which a WA is issued does not require amendment by the originating office. The guidelines and authorizations in this chapter do not affect the amendment Instructions for various products contained in other WSOM chapters. Regardless of whether coordination has yet been accomplished, CWSU products will be relayed to the appropriate intra- and inter-facility communications system(s) as valid updates or amendments of the relevant products. They will remain valid unless and until canceled by the CWSU or superseded by subsequent issuances from the responsible NWS unit, national center, or office. CWA's not issued in relation to any other product will be disseminated as valid weather advisories. CWSU products are immediately available for all dissemination methods including radio broadcasts by ARTCC, FSS, and terminal facility personnel.

4.5 Relationship of CWSU to FSS. Each CWSU acts as a source of meteorological expertise to specific Flight Service Stations, including those with EFAS positions, when weather conditions impede or threaten the normal flow of air traffic. However, preshift briefings for FSS personnel will not normally be done by the CWSU. These, and routine weather support, remain the responsibility of designated weather service forecast offices or weather service offices. This ensures that the link with an NWS facility capable of providing full-time support will remain clear cut. Close cooperation should exist, however, between the CWSU and EFAS (Flight Watch) staffs since on-duty CWSU meteorologists will be continuously aware of my aviation weather forecast problems and EFAS specialists have access to additional sources of PIREP information. In addition, any requests, for Pilot Weather Briefings received by the CWSU from outside the ARTCC and any from within the center which workload prohibits, will normally be referred to the FSS.

4.6 Relationship of CWSU to the WSFO/Area Manager and Region.. The CWSU meteorologists are under the supervision of the CWSU MIC whose first line supervisor is the NWS area manager (AM) whose area of responsibility includes the operating location of the CWSU. The AM's FAA contact at the ARTCC is the ATM or an appropriate designee. Technical guidance and support for the CWSU is also the responsibility of the AM who may designate the Weather Service Evaluations Officer (WSEO) as the focal point for this activity. It. is expected that the AM or designee will maintain a working level familiarity with the CWSU's operations and will therefore be in a position to adequately support the technical and coordination requirements of the CWSU with other NWS facilities. Semiannual visits to the CWSU should be made by the WSEO. A written report of each visit should be sent to the Regional Aviation Meteorologist (RAM) (or the regional official in an equivalent position) through the AM with copies to the CWSU MIC and the ATM. The NWS contact, for operational policies or practices which imply or require departures from the instructions in this chapter or those in the approved CWSU SDM, is the RAM (or

equivalent) of the region in which the CWSU is located. The RAM will consult with the appropriate CWSU MIC on any proposed variances and will advise NWS Headquarters, Aviation Services Branch prior to implementation.

4.7 Station Duty Manual (SDM). All CWSU's will maintain an SDM in accordance with existing NWS directives. The SDM is developed in consonance with the ATM or appropriate designee and will contain all guidelines and instructions for meeting national and agreed to local requirements. No variations in the national standards will be implemented without prior approval (see Section 4.6).

A copy of all SDM's should be on file with the NWS area manager having administrative responsibility. A copy will be forwarded to the Regional Aviation Meteorologist (or equivalent) for review, to ensure that basic minimum requirements are met and that CWSU operations within the region are as standardized as local ARTCC requirements permit. Regional and area manager approval of all SDM's are required. Review and approval of SDM changes or amendments are required prior to implementation. A historical SDM file will be maintained at the WSFO having administrative responsibility for the CWSU. Retention of superseded and/or canceled portions of the SDM in this file will be in accordance with WSOM Chapters A-13 and D-90 and any applicable subsequent issuances.

4.8 Handling of Weather Records.

4.8.1 Retention. All written records composed at CWSU's (shift briefing texts/content, MIS's, and CWA's) will be retained by the unit for 1 month and then mailed to the WSFO that has administrative responsibility for the unit. It will be retained for 5 years at that office. Daily Record of Facility Operation (FAA 7230.4 or equivalent) sheets will be retained at the CWSU for 90 days. FAA retention of copies of this record is the responsibility of the ATM.

4.8.2 Protection of Records. All requests for certified copies of weather exhibits prepared by the CWSU meteorologists and all requests for uncertified copies from anyone other than the management of the assigned ARTCC should be directed to the retaining WSFO. Requests coming during the 30-day CWSU retention period will still be processed through the WSFO. In the event of an accident (within the area of responsibility of the ARTCC facility), retention procedures described above will be followed unless otherwise requested by the Aviation Safety and Evaluation (ASE) Program Leader, NWS Headquarters. In the event of a major accident, all pertinent products prepared by the CWSU meteorologists and other pertinent observations, charts, and forecasts available to the CWSU meteorologists should be forwarded to the appropriate AM as soon as possible. These records will be protected and retained in the WSFO for at least 1 month to provide time for determining:

a. to what extent weather is a factor, and/or

b. what weather information will be required for investigation purposes.

After this period, normal retention procedures will be followed unless the ASE Program Leader requests otherwise. The definition of a major accident is contained in WSOM Chapter D-90.

4.8.3 Statements. No written statements by CWSU meteorologists concerning a system incident, or an aircraft incident or accident, will be provided to offices, agencies, organizations, or individuals (government or public) outside of the NWS without the approval of the ASE Program Leader. Any such statements will concern only the meteorological facts and must be reviewed by the appropriate regional headquarters and the ASE Program Leader. The statement may also be forwarded to the NOAA General Counsel before being furnished to the requester. When a written statement is prepared, one copy will be forwarded to regional headquarters through the NWS AM. A second copy will be forwarded directly to the ASE Program Leader.

The comments of CWSU meteorologists are not a matter of public record. There is no requirement that anyone other than members of a government investigation team be allowed to question or interview personnel in connection with an aircraft accident. When an accident has occurred and the details are being discussed by persons outside of the NWS; or when being questioned or interviewed in connection with an accident, NWS personnel should attempt to determine that their verbal comments are not being recorded. Should a request to record such comments be made it will be referred to the ASE Program Leader. Any such arrangements will be made at the regional or NWS headquarters level.

5. Weather Service Forecast Office (WSFO). The WSFO will provide meteorological support to the ARTCC through the CWSU. During CWSU off-duty hours, WSFO support will be through the weather coordinator ATM or appropriate designee.

Open lines of communication must be maintained between the WSFO's, CWSU's, FSS's, and towers within the ARTCC area to ensure the timely exchange of necessary weather information. The NWS area manager has the responsibility to monitor and evaluate the various links between the relevant NWS and FAA facilities. This may be delegated to the WSEO. Any deficiencies will be documented and forwarded to the RAM (or equivalent) either as part of a WSEO station visit report (with appropriate distribution) or as a separate memo with copies to the supervisors of the NWS and FAA facilities or units involved. Attempts to remedy any deficiencies should be made at the local level. However, if all else fails, the problem should be brought to the NWS regional or headquarters level where steps will be taken to ensure that the requirements and responsibilities placed on an NWS facility will be reduced to a level that available communications can support.

SECTION 5 SUPPORT TO AIR TRAFFIC FACILITIES (D-25)

Included in the communications capabilities should be links that will allow the designated WSFO or WSO to:

a. provide CWSU and/or FSS pre-shift briefings as per local arrangements;

b. assist the ARTCC during in-flight emergencies when a pilot could be involved in a critical weather situation (if CWSU is not in operation); and

c. provide ARTCC with critical weather updates (if CWSU is not in operation).

All NWS forecasts (FA's, FT's, advisories, warnings, etc.) will be received at the ARTCC via the Weather Message Switching Center (WMSC). The WSFO will give the following weather information to the CWSU or to the weather coordinator when CWSU meteorologists are not on duty:

Terminal Weather - A forecast of heavy snow, freezing precipitation, or low IFR ceiling and/or visibility conditions which may disrupt landing/takeoff operations at large hub area airports is cause for alerting the relevant CWSU/ARTCC. During CWSU off-duty hours, the WSFO should notify those control tower facilities to which direct communications (e.g., Hotlines) have been provided.

6. NWS Support Facilities for CFWSU/CWSU. The NWS support facilities listed below are available to CFWSU and to CWSUPs for consultation.

a. National Meteorological Center -- Aviation Weather Branch;
b. National Severe Storms Forecast Center;
c. National Aviation Weather Advisory Unit (or Alaska WSFO's);
d. National Hurricane Center; and
e. Eastern Pacific Hurricane Center (WSFO San Francisco).

CFWSU will be the usual CWSU interface with the national centers; however, because of the direct availability of PIREP's at the ARTCC's, a national center or unit may contact the CWSU directly for real-time data.

6.1 National Meteorological Center (NMC), Aviation Weather Ranch. NMC provides routine aviation guidance forecasts of cloud cover, ceilings, visibilities, turbulence, icing, and wind. This guidance includes Clear Air Turbulence forecasts that can be refined through the timely receipt of PIREP's.

6.2 National Severe Storms Forecast Center (NSSFC). NSSFC is responsible for issuing messages concerning expected severe local storms, including tornadoes. NSSFC alerts CFWSU of impending Severe Weather watches.

6.3 National Aviation Weather Advisory Unit (NAWAU). NAWAU issues aviation area forecasts, nonconvective In-flight Advisories (AIRMETs and

SIGMET's) and hourly and special Convective SIGMETs when conditions warrant (see WSOM Chapter D-20 and D-22). This unit rust closely interact with CWSU's both for requesting and receiving PIREP's and for coordination of NAWAU and CWSU products.

The NAWAU will also give the following weather information to the CFWSU or the CFCF shift supervisor for relay to the appropriate CWSU or to the weather coordinator when CWSU meteorologists are not on duty:

Pressure Trends - NAWAU should notify CFWSU/CFCF whenever significant pressure changes are expected. A pressure change is considered to be significant when the surface pressure change equals one-half inch of mercury (approximately 17 millibars) or more during an 8-hour period. This information will be used to alert controllers to changes in the lowest usable flight level above 18,000 feet. See exhibit D-22-4.

In Alaska, WSFO's issue Area Forecasts and/or In-flight Advisories and must provide support equivalent to that provided by NAWAU.

6.4 National Hurricane Center (NHC). NHC has tropical storm and hurricane forecast and warning responsibility for the Atlantic, Caribbean, and Gulf of Mexico. Part of its warning responsibility is delegated to Hurricane Warning Offices at Boston, Washington, and San Juan. The Eastern Pacific Hurricane Center at San Francisco is responsible for tropical storm warnings for the Eastern Pacific Ocean from 140 West longitude to the West Coast of the U.S. The tropical storm and hurricane advisories are issued routinely every 6 hours, as warranted. The CWSU may consult directly with the appropriate hurricane center concerning tropical stoma and hurricane advisories which could directly impact their ARTCC area of responsibility.

6.5 Satellite Services Unit (SSU). SSU's located at Washington, DC; Miami, FL; New Orleans, LA; Kansas City, MO; San Francisco, CA; Anchorage, AK, and Honolulu, HI, are available to support the CFWSU and CWSU's. This support is in two forms. First, the SSU is responsible for transmitting Geostationary Operational Environmental Satellite (GOES) photos and also preparing and distributing Satellite Interpretation Messages (SIM) four times daily (except Miami) with updates as required. Second, the SSU provides a consultation service to the CWSU on a real-time basis to discuss developing weather as viewed from satellites.

The CWSU meteorologist should contact the SSU • ▪ asistance is required. However, the SSU may take the initiative to contact the CWSU when the SSU meteorologist sees a development known to be of operational concern to the CWSU. Because of the direct availability of PIREP's at the ARTCC, the SSU may also contact the CWSU directly for real-tire data.

SECTION 6 SUPPORT TO AIR TRAFFIC FACILITIES (D-25)

91.81 Altimeter Settings.

(a) Each person operating an aircraft shall maintain the cruising altitude or flight level of that aircraft, as the case may be, by reference to an altimeter that is set, when operating --

(1) Below 18,000 feet MSL, to-

(i) The current reported altimeter setting of a station along the route within 100 nautical miles of the aircraft;
(ii) If there is no station within the area prescribed in subdivision (i) of this subparagraph, the current reported altimeter setting of an appropriate available station; or
(iii) In the case of an aircraft not equipped with a radio, the elevation of the departure airport or an appropriate altimeter setting available before departure; or

(2) At or above 18,000 feet MSL, to 29.92" Hg.

(b) The lowest usable flight level is determined by the atmospheric pressure in the area of operation, as shown in the following table:

Current Altimeter Setting	Lowest Usable Flight Level
29.92 (or higher)	180
29.91 thru 29.42	185
29.41 thru 28.92	190
28.91 thru 28.42	195
28.41 thru 27.92	200
27.91 thru 27.42	205
27.41 thru 26.92	210

(c) To convert minimum altitude prescribed under §§91.79 and 91.119 to the minimum flight level, the pilot shall take the flight-level equivalent of the minimum altitude in feet and add the appropriate number of feet specified below, according to the current reported altimeter setting:

Current Altimeter Setting	Adjustment Factor
29.92 (or higher)	NONE
29.91 thru 29.42	500 feet
29.41 thru 28.92	1000 feet
28.91 thru 28.42	1500 feet
28.41 thru 27.92	2000 feet
27.91 thru 27.42	2500 feet
27.41 thru 26.92	3000 feet

Exhibit D-2304: Federal Aviation Regulation Part 91, Para. 91.81 - Altimeter Setting

*U.S. GOVERNMENT PRINTING OFFICE : 1984 0-421-428/2332